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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR  | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 09/916,064      | 07/26/2001  | Michael Allen Seigler | SEAG 48089          | 7270             |

7590

01/14/2004

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| EXAMINER |
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KIM, PAUL D

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| ART UNIT | PAPER NUMBER |
|----------|--------------|

3729

DATE MAILED: 01/14/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/916,064

Applicant(s)

SEIGLER ET AL. *ch*

Examiner

Paul D Kim

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 8-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This office action is a response to the amendment filed on 11/28/2003.

#### ***Election/Restrictions***

1. Newly submitted claims 22 and 23 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: In Paper No. 5, examiner indicated that Species D is for a method for making a magnetic sensor for a disk drive read using a self-planarizing material with a process of planarizing the self-planarizing material with vacuum etching process, which is drawn to claims 19-20.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 22 and 23 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

#### ***Specification***

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The phrase "the surface of the wafer" recited in line 5 of claim 1 does not disclose in the specification.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2 and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Bussmarm et al. (CPP Giant Magnetoresistance of NiFeCo/cu/ CoFe/cu Multilayers).

Fig. 2 of Bussmarm et al. teach a process for manufacturing a magnetic sensor for a disk drive comprising steps of: facilitating a giant magnetoresistive stack on a surface of a layer of bottom shield material, the giant magnetoresistive stack including an etching stop layer (Copper: exposed surface after RIE etching process to form the GMR) and a buffer layer on the top of the etching stop layer as shown in Fig. 1 (a) and (b); depositing an insulating material on the giant magnetoresistive stack and the surface of a layer of bottom shield material; planarizing the insulating material through the buffer layer to form a top surface of the insulating material lying in a plane and removing the buffer layer as shown in Fig. 2 (c); and depositing a top shield layer on the insulating material and the giant magnetoresistive stack, the top shield layer making electrical contact with the giant magnetoresistive stack as shown in Fig. 2 (d) (see also page 924 and 925).

As per claim 2 the planarizing the insulating material is performed by the chemical machining process (CMP).

As per claim 5 the insulating material is made of nitride.

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As per claim 6 the stop layer exposed surface after RIE etching process to form the GMR is made of copper.

As per claim 7 the buffer layer is made of nitride.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bussmarm et al. in view of Thomas et al. (US PAT. 6,483,662).

Bussmarm et al. teach all of the limitations as set forth above except using a vacuum etching process for planarizing insulating material. Thomas et al. teach a method of making a magnetoresistive element including a process of planarizing insulating material by either CMP or other suitable etching process such as focused ion beam for planarizing the material surface to a fine level (col. 6, lines 3-25). Therefore, it would also have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of planarizing insulating material of Bussmarm et al. by vacuum etching process such as focused ion beam as taught by Thomas et al. for the purpose of planarizing the material surface to a fine level.

***Allowable Subject Matter***

6. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

7. Applicant's arguments filed 11/28/2003 have been fully considered but they are not persuasive. Applicant argues that the prior art of record fails to disclose the claimed invention such as the etch stop layer is positioned on an end of the giant magnetoresistive stack opposite the surface of the wafer and a buffer layer positioned on the etch stop layer. Examiner traverses the argument that it is confused as to what the surface of the wafer is indicated in the claimed invention. Also, the etch stop layer (Copper) of Bussmarm et al. as shown in Fig. 2 (b) is positioned at the end (top) of the giant magnetoresistive stack opposite the surface of the bottom shield layer and the buffer layer (Nitride) positioned on the etch stop layer.

Applicant argues that the prior art of record fails to disclose the claimed invention such as etching the buffer layer to the etch stop layer. During the planarizing process for the insulating material passing through the buffer layer as shown in Fig. 2 (C), the buffer layer is finally removed by CMP to expose the etch stop layer.

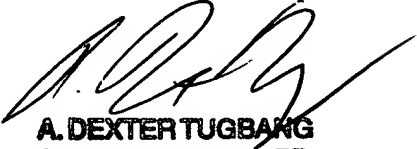
***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D Kim whose telephone number is 703-308-8356. The examiner can normally be reached on Tuesday-Friday between 8:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5648.

  
**A. DEXTERTUGBANG  
PRIMARY EXAMINER**

pdk